

OEP Technology Development Ring

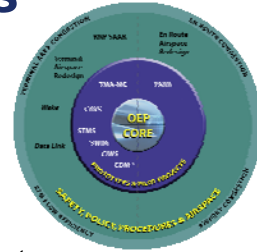
May 2006



Federal Aviation
Administration



Prototypes & Pilot Projects Transition Ring



- **Transition Manager**

- Ken Leonard, ATO-P Acting Director of Technology Development

- **Purpose**

- Monitor the progress of promising capacity enhancement initiatives that are under technical development or do not have a firm implementation schedule.

- **Initiatives & Program Lead**

- New** – Advanced Continuous Descent Arrival (CDA), *James McDaniel*
- New** – Route Availability Planning Tool (RAPT), *Danny Simms*
- CDTI-Assisted Visual Separation (CAVS), *Jim McDaniel*
- Corridor Integrated Weather System (CIWS), *Raymond Moy*
- Surface Traffic Management System (STMS), *William Hall*
- System-Wide Information Management (SWIM), *John Loynes*
- Traffic Management Advisor–Multi-Center (TMA-MC), *Steve Bradford*



Notes:

Prototypes & Pilot Projects Transition Ring

Transition Manager

Ken Leonard, *Acting Director of Technology Development*

Within the Prototypes & Pilot Projects Transition Ring, OEP monitors the progress of promising capacity enhancement initiatives that currently are either under technical development or do not have a firm implementation schedule.

Two initiatives that appeared in Version 7 have since been removed: Problem Analysis, Ranking and Resolution (PARR), an offshoot of URET, has no active program in FAA; Collaborative Decision Making (CDM) has morphed into the FAA's new Collaborative Air Traffic Management Technologies (CATMT) program, some of its activities are included in FLOW-2.

Initiative Leads

Advanced Continuous Descent Arrival, *James McDaniel*
 Route Availability Planning Tool (RAPT), *Danny Simms*
 Traffic Management Advisor–Multi-Center (TMA-MC), *Steve Bradford*,
 Surface Traffic Management System (STMS), *William Hall*
 CDTI-Assisted Visual Separation (CAVS), *Jim McDaniel*
 Corridor Integrated Weather System (CIWS), *Raymond Moy*
 System-Wide Information Management (SWIM), *John Loynes*

Prototypes & Pilot Projects Transition Ring

New Initiatives

- **Advanced Continuous Descent Arrival (CDA)**
 - Procedures provide a vertical flight profile with engine idle operations from top of descent to runway touchdown. The Advanced CDA procedures offer reduced landing time, fuel burn, engine emissions, and noise. Advanced CDA utilizes Merging and Spacing (MS) and ADS-B capabilities to achieve desired spacing between aircraft to achieve arrival optimization.
- **Route Availability Planning Tool (RAPT)**
 - A prototype tool operating in the New York area. RAPT integrates CIWS convective and echo top forecasts with existing planned departure routes. RAPT allows ATC users to use existing and future gaps in weather. RAPT improves departure management and collaboration by providing common situational awareness in both the Terminal and En Route environments. RAPT identifies opportunities for departure paths to fly over, around, or between convective weather. Funding for RAPT begins in FY07.



Notes:

New Initiatives

Advanced Continuous Descent Arrival (CDA), procedures provide a vertical flight profile with engine idle operations from top of descent to runway touchdown. The Advanced CDA procedures offer reduced landing time, fuel burn, engine emissions, and noise. Advanced CDA utilizes Merging and Spacing (MS) and ADS-B capabilities to achieve desired spacing between aircraft to achieve arrival optimization.

Scope and Applicability: The Advanced CDA procedure requires new tools and procedures for both the flight deck and airline operations center. The purpose of the application is to make minor, early speed adjustments so as to avoid late and or frequent heading or speed changes at lower, less fuel efficient altitudes. Advanced CDA is a UPS airline initiative that focuses on improving efficiency. Key issues regarding Advanced CDA are:

- Advanced CDA is voluntary and requires user investment
- Advanced CDA will be initially demonstrated during nighttime airport operations that coincide with a low traffic environment.
- Advanced CDA will be extended to additional users and airports as application costs and benefits are refined.

Issues for Transition to Core OEP: Advanced CDA activities utilizing Merging and Spacing, CDTI and ADS-B technology applications require further development, demonstration, and certification prior to transition to the OEP Core.

Route Availability Planning Tool (RAPT), a prototype tool operating in the New York area. RAPT integrates CIWS convective and echo top forecasts with existing planned departure routes. RAPT allows ATC users to use existing and future gaps in weather. RAPT improves departure management and collaboration by providing common situational awareness in both the Terminal and En Route environments. RAPT identifies opportunities for departure paths to fly over, around, or between convective weather. Funding for RAPT begins in FY07.

Scope and Applicability : Benefits could be realized at all airports where the departure rates during SWAP are typically less than the lesser of the demand and the arrival rate. This would include all of the OEP 35 airports east of the Rocky Mountains plus Las Vegas and Phoenix. RAPT requires information on departure route structure, typical times for departures to reach various key fixes, and accurate forecasts of storm locations, severity, and storm altitude structure such as are provided by the Corridor Integrated Weather System (CIWS).

Issues for Transition to Core OEP: RAPT has been developed and maintained by the Port Authority of New York and New Jersey. The FAA is assuming ownership beginning in FY 2007 at which time further evaluation and benefits studies will be initiated. In addition, the applicability of adapting RAPT into the Traffic Flow Management (TFM) infrastructure will be investigated. Finally, RAPT currently uses state-of-the-art weather forecasts provided by CIWS. CIWS itself is a prototype that will need an FAA decision in order to become an official source of weather information required by RAPT.

Prototypes & Pilot Projects Transition Ring

Continuing Initiatives

- **Cockpit Display of Traffic Information Assisted Visual Separation (CAVS)**
 - Utilizes cockpit displays of traffic information to improve a pilot's airborne situational awareness for visual spacing applications. The objective is to enable VMC approach operations to continue in weather conditions which now require IFR.
- **Corridor Integrated Weather System (CIWS)**
 - A prototype system that provides traffic flow managers with comprehensive convective weather data needed for tactical modifications and which significantly improves short-term convective weather decision-making.
- **Surface Traffic Management System (STMS)**
 - A decision support tool that provides better surface surveillance information to air traffic controllers and air traffic managers, which improves efficiency in low visibility conditions.



Notes:

Continuing Initiatives

Cockpit Display of Traffic Information Assisted Visual Separation (CAVS), involves the use of cockpit displays of traffic information to improve a pilot's airborne situational awareness for visual spacing applications. The objective is to enable VMC approach operations to continue in weather conditions which now require IFR.

Scope and Applicability : Initial use of the CDTI by UPS in 107 aircraft during regular visual approach operations was implemented with no changes to current air traffic control procedures, visibility, or weather criteria.

The context for the next step in application development, CAVS, is to allow approaches as close operationally as possible to current visual approaches as defined in FAA Order 7110.65 (Air Traffic Control). Phraseology, separation responsibility and other aspects of the application are intended to be as similar as possible to current visual approach operations. The intent is for this application to be used in conditions where visibility with aircraft to follow cannot be maintained, but all aircraft remain in VMC.

Issues for Transition to Core OEP: Business case for ADS-B/CDTI equipage is not supported based on this application alone, but on multiple safety and operational benefits not directly related to this single application

- Development of procedures that support operations in a mixed equipage environment
- Demonstration of benefits in a mixed equipage environment
- Pilot acceptance of workload in real-world conditions, CDTI tools, and cockpit display location
- Controller acceptance of workload, compatibility with current operations, and ability to identify equipped aircraft
- Integration of ADS-B into ARTS and STARS automation systems
- Ability to support various parallel runway operations

Corridor Integrated Weather System (CIWS), a prototype system that provides traffic flow managers with comprehensive convective weather data needed for tactical modifications and which significantly improves short-term convective weather decision-making.

Scope and Applicability: CIWS is a prototype system at the Command Center, 8 ARTCC and 6 TRACON facilities in the northeast.

Issues for Transition to Core OEP: CIWS is not funded for FY07. Without funding the result is a loss of operational capability for thunderstorm delay reduction. Due to the dependence of RAPT on CIWS, the improvements in departures at New York would no longer be realized starting FY07.

Surface Traffic Management System (STMS), a decision support tool that provides better surface surveillance information to air traffic controllers and air traffic managers, which improves efficiency in low visibility conditions.

Scope and Applicability: STMS will provide surface traffic management improvements in IFR and VFR conditions. STMS functionality will be scalable to be used at airports with or without available traffic movement sensors such as ASDE-X.

Issues for Transition to Core OEP:

- Continued prototype support
- Business case for acquisition of STMS

Prototypes & Pilot Projects Transition Ring

Continuing Initiatives

- **System Wide Information Management (SWIM)**
 - Will provide the infrastructure, standards and procedures needed to conduct network-enabled operations in the NAS so that precise information is available in the right format and at the right time to all authorized users.
- **Traffic Management Advisor-Multi Center (TMA-MC)**
 - A decision support tool that will provide enroute controllers and traffic management coordinators with a single, coordinated spacing plan that maximizes traffic arrivals across multiple facilities.



Notes:

Continuing Initiatives

System Wide Information Management (SWIM), will provide the infrastructure, standards and procedures needed to conduct network-enabled operations in the NAS so that precise information is available in the right format and at the right time to all authorized users.

Scope and Applicability: SWIM is extendable to all NAS systems that generate or use data.

Issues for Transition to Core OEP: SWIM is in the preliminary development stage. Current activities include development of NAS/SWIM data architecture and framework, the benefit/cost analysis, architectural definitions, and the detailed planning required to bring the concept to an investment decision.

Traffic Management Advisor-Multi Center (TMA-MC), a decision support tool that will provide en route controllers and traffic management coordinators with a single, coordinated spacing plan that maximizes traffic arrivals across multiple facilities

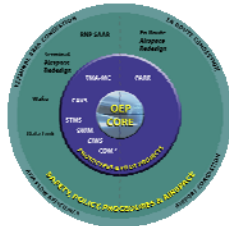
Scope and Applicability: TMA is applicable for airports where arrival demand regularly exceeds capacity.

Issues for Transition to Core OEP:

- Finalize analysis of the already deployed TMA-SC and the prototype TMA-MC to ensure operational integrity is maintained.
- Identification of requirements and costs to consolidate TMA-SC and TMA-MC into a single, national standard baseline for deployment.
- Identify implementation alternatives, including funding sources and costs, necessary for an investment decision.

Prototypes & Pilot Projects Transition Ring

Entry Criteria



Advanced Continuous Descent Arrival (CDA)	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	YES	YES	New
Route Availability Planning Tool (RAPT)	YES	YES	YES	YES	YES	YES	YES	YES	YES	New
Cockpit Display of Traffic Information Assisted Visual Separation (CAVS)	YES	YES	YES	YES	UNKNOWN	UNKNOWN	YES	YES	YES	
Corridor Integrated Weather System (CIWS)	YES	YES	YES	UNKNOWN	YES	YES	YES	YES	YES	
Surface Traffic Management System (STMS)	YES	YES	YES	YES	YES	YES	YES	YES	YES	
System Wide Information Management (SWIM)	YES	YES	YES	YES	YES	YES	YES	YES	YES	
Traffic Management Advisor-Multi Center (TMA-MC)	YES	YES	YES	YES	YES	YES	YES	YES	YES	

*UNKNOWN: Most prototype technologies have multiple alternatives and phases which are evaluated during the development process. Until we have a record of decision identifying a specific solution we will report

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Entry Criteria for the Prototypes & Pilot Projects Transition Ring

- Reasonable estimate of all implementation costs exists and the project is expected to be affordable by all parties involved
- Reasonable estimate of benefits exists
- Risks appear to be manageable
- There are both an FAA operations and an operating user champion.
- Any necessary policy either exists or is being worked on as part of the project
- There is a reasonable schedule estimate of when the benefits will accrue if events go well, and the schedule starts within the next 10 years
- The change is consistent with the current or the planned future operations concepts
- The effort is in field trial or field evaluation or has specific plans for field trial or field evaluation

Details about these programs can be found in the Smart Sheets published at www.faa.gov/programs/oep.